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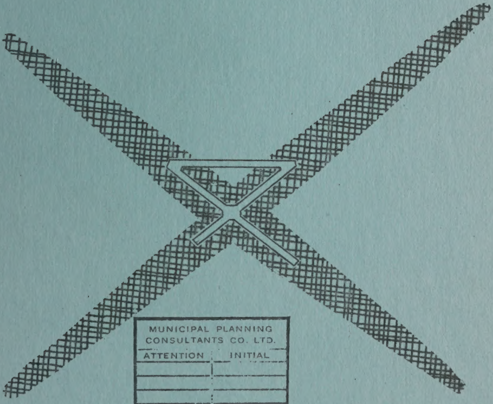
LAND USE DETERMINANTS
OSHAWA AIRPORT ENVIRONS



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Prepared by

Central Ontario Joint Planning Board

1969

NOTE

THIS REPORT WAS PRESENTED TO THE CENTRAL ONTARIO JOINT PLANNING BOARD ON SEPTEMBER 4, 1969. THE REPORT WAS THEN CIRCULATED TO THE AREA'S FIVE LOCAL PLANNING BOARDS AND THE DEPARTMENT OF TRANSPORT, CANADA, WITH A REQUEST FOR THESE AGENCIES' COMMENTS. SUBSEQUENTLY, COMMENTS WERE RECEIVED AND DISCUSSED BY THE BOARD.

AT ITS NOVEMBER 20TH MEETING THE BOARD AUTHORIZED ITS STAFF, AS A FOLLOW-UP TO ITS REGIONAL PLAN REPORT AND THIS RESEARCH REPORT, TO PROCEDE WITH A DETAILED STUDY OF THAT PART OF THE CITY OF OSHAWA AND THE TOWN OF WHITBY IN PROXIMITY TO THE OSHAWA AIRPORT. SUCH STUDY IS TO BE UNDERTAKEN IN CLOSE LIAISON WITH THE STAFF OF LOCAL MUNICIPALITIES AND OTHER CONCERNED AGENCIES.

AT ITS DECEMBER 4TH MEETING THE BOARD RESOLVED TO "receive the Airport Report and adopt it in principle, and that its contents, including the recommendations, be considered as a guide in the undertaking of the recently authorized detailed Land Use and Community Study in Oshawa and Whitby." (paragraph 2 above)

THE BOARD INSTRUCTED THAT THIS NOTATION BE PLACED IN THE REPORT TO ADVISE THE READER OF THE "general adoption of this research document and the contemplated use of its contents as guidelines in a more detailed study, to be undertaken of the Northglen Community of Oshawa and adjacent communities in the Town of Whitby."

December 5, 1969

CENTRAL ONTARIO JOINT PLANNING BOARD

WILLIAM F. H. MCADAMS, M.T.P.I.C.
DIRECTOR OF PLANNING

OSHAWA SHOPPING CENTRE
KING STREET WEST
OSHAWA, ONTARIO
723-3411 AREA CODE 416

LETTER OF TRANSMITTAL

August 28, 1969

Mr Walter Beath, Chairman,
and Members,
Central Ontario Joint Planning Board.

Gentlemen:

In our Regional Plan Report, submitted to the Board earlier this year, we made certain preliminary proposals for lands located in close proximity to the Oshawa Airport. About the same time, the City of Oshawa Planning Department proposed the expansion of residential development to the west and north of the airport.

It was decided to undertake this study of "Land Use Determinants, Oshawa Airport Environs", in order to document the existing and possible future effects of the airport upon surrounding lands in order to provide a better basis for future land use planning in this area.

The following report endeavours to serve that purpose.

Respectfully submitted,

Wm F H McAdams, M.T.P.I.C.
Director of Planning

WFHMcA:ms

CENTRAL ONTARIO JOINT PLANNING BOARD

1969

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LAND USE DETERMINANTS
OSHAWA AIRPORT ENVIRONS

1. INTRODUCTION

The primary purpose of this report is to examine the various factors which have an influence on the determination of future land uses of undeveloped land adjacent to Oshawa Municipal Airport. Such an analysis necessitated considerable research into many aspects of the airport environment as it exists today and as it might develop in the future. Such matters as the volume of aircraft movement, aircraft noise generation and the airport's economic relationship to the area are considered.

Much attention has been focused on the airport recently as the result of a number of studies which have been and are about to be undertaken.

The first of these was a report entitled "Oshawa Municipal Airport - A Report on Airport Improvements" completed in February, 1968 by Proctor and Redfern Consulting Engineers. The report deals primarily with the proposed expansion of airport runways and facilities.

The City of Oshawa Planning Board and the C.O.J.P.B. have recently completed studies which led to the preparation of a Draft Official Plan and Regional Plan Report respectively. Certain areas of conflict between the two plans were identified including the proposed land use designation of lands to the north and west of Oshawa Airport. It was therefore decided to undertake a "Special Study" of this area.

The Federal Government recently announced commencement of a study of Oshawa Airport to evaluate the costs and benefits of airports without scheduled airline service. This study is separate from other studies relating to the expansion of the airport and the adjacent land uses. It is also anticipated that the airport will be considered within the framework of the Oshawa Area Planning and Development Study.

Upon acceptance of this report, specific land use proposals for the area around the airport will be developed in co-operation with the City of Oshawa Planning Department.

2. ECONOMIC VALUE TO THE COMMUNITY

It is difficult to define the economic benefit of the airport to the surrounding communities. Oshawa Airport has a higher level of itinerant traffic than the other general aviation airports in the Toronto Region. This provides an economic advantage to the City in that stopovers result in tourist spending. This may be expected to increase in view of the projected growth of airport traffic. The proposed improvements to airport facilities would also make it more attractive to transient pleasure craft.

The expansion of the airport would also permit its use by a wider range of freight and executive aircraft. The largest commercial user is General Motors. In 1966 they made 95 landings with their smaller aircraft. An estimated 50 additional landings were made at Toronto International because of weather and airport restrictions at Oshawa. In 1967 it is understood that General Motors made 73 flights into Oshawa and 118 flights into Toronto International due primarily to increased use of larger aircraft particularly their Convair 540. These figures apply to aircraft owned by General Motors and do not include chartered freight flights.

In the Fall of 1967, the City circulated a questionnaire to industries within a radius of 20 miles to determine present or

potential airport users. One hundred and eighty-eight companies were canvassed, and 96 replies were received. Of these replies, 23 firms indicated that they were now using the airport, with from one to twelve flights per year.

There would appear to be a growing demand by industry for the use of air transportation facilities. Large firms in particular tend to utilize aircraft for transportation of executives, salesmen and customers and for the delivery of urgently required freight.

As part of this study contact was made with several municipalities in Ontario having airports similar to Oshawa's. The City of Kitchener advised that almost all major industries have their own company plane. Several industries are presently contemplating the use of helicopter service between their plant and the airport. The Cities of Galt, Brantford and Sarnia are also experiencing an increasing use of airport facilities by industry. It is interesting to note that in 1965 the State of Ohio instituted a state assisted industrial and community airport and development program. Since that time 15 industrial airports have been built resulting in major industrial expansion in the State. The airstrips became a major inducement in attracting industry.

Growing recognition of modern airports as stimulants to industrial and commercial growth and development in their environs is emphasized by an article in a recent issue of Airlift Magazine. The author, Leigh Fisher, states:

> "Air transport is being closely integrated into business commercial planning. Offices, factories and warehouses are being located, expanded and reorganized to take full advantage of air transportation's speed, flexibility and economy.
>
> Relying on air transportation industry is becoming more footloose in picking plant sites. Decentralization comes easier. Top management has a new mobility to spread over the nation in a matter of hours. Air shipment helps cut shelf inventories and air transport is daily becoming a vital factor in more and more industrial-commercial operations.
>
> With this trend, business is insisting on a closer tie to airports. As a result, industrial-commercial concentrations at major airport cities, and most noticeably in industrial areas adjacent to airports, is becoming more commonplace.
>
> Until five years ago, most industrial site specialists shied away from near-airport sites, fearing noise and hazard. But as business executives became aroused by

office/plant-to-airport commuting times, they began to demand airport proximity. The picture has so changed that today industrial realtors feel airport-oriented industrial complexes will have as great an impact on future business location patterns as the shopping center had in retail fields.

A few communities have been quick to note this trend and capitalize on it, not only through increasing airport traffic but also as a means of halting residential encroachment on airport boundaries. The industrial area offers a better airport buffer strip than trees or open land and its tenants become active defendants of the airport's operation and improvement."

3. VOLUME OF AIRCRAFT MOVEMENT

EXISTING

Over the past few years there has been an increase in the volume of aircraft movement at Oshawa Airport. The bulk of this movement consisted of privately owned light aircraft as illustrated in Appendix 1. However, it is to be noted that the use of the airfield by all aircraft classifications specified by the Department of Transport has been growing. This includes itinerant, executive and cargo aircraft, both domestic and transborder flights. It is understood that during 1968 about 2,000 aircraft movements consisted of charter freight aircraft transporting supplies to and from local industries.

In 1968 Oshawa Airport ranked fourth in Canada in terms of aircraft movements for airports not having Department of Transport Control Towers. As the result of this volume a control tower has recently been constructed.

A significant increase in aircraft movements is being experienced by a majority of airports across Canada and Appendix 2 of this report indicates aircraft movement statistics for comparative purposes for a number of growing municipalities in Ontario in which airports are situated.

FUTURE

In December, 1968 the Civil Aviation Branch of the Federal Department of Transport published a report entitled, "A Study of General Aviation in the Toronto Area".

This report included examination of future general aviation requirements for 12 airports in the Toronto area which are considered to form a regional system. The report projected an 8% annual increase in aviation movement as a probable average growth rate. This figure was not based on historic or economic data and forecasts but represents the past national trend. The following figures applying to the Toronto Region as a whole have been extracted from the aforementioned report. Aircraft takeoffs and landings at Oshawa Airport have been added on the basis of an 8% annual increase.

TABLE 1

AIRCRAFT MOVEMENTS

	ANNUAL		DAILY AVERAGE
Year	Toronto Region	Oshawa	Oshawa
1967	1,020,313	68,401	188
1972	1,535,105	88,892	244
1977	2,256,155	130,610	358
1982	3,314,740	191,906	526

This report also established what was termed the theoretical capacity of Toronto Regional Airports. Oshawa airport was assigned a theoretical capacity of 165,000 annual aircraft movements. Comparison of this figure with the projected movements would indicate that Oshawa Airport will reach its capacity by about 1980. However, as Oshawa forms part of the Toronto Regional System, and considering the fact that when a particular airport reaches its capacity any further traffic would be directed to another airport, the capacity of the present system will be reach by approximately 1975-6. The theoretical capacity assumes an average delay of two minutes and if the operators of an airport are willing to accept a higher average delay at peak periods, the capacity could be increased. In effect, this means the theoretical capacity outlined could be lower than the rate which may be achieved. Forecasts related to Oshawa Airport were based on existing facilities. It is not known what effect the proposed improvements would have.

4. PROPOSED AIRPORT EXPANSION

In February 1968, Proctor and Redfern Consulting Engineers completed a report which proposed expansion of airport facilities. The following are some of the recommendations which were proposed:-

a) extension of runway 30/12 from 3,476 feet to 5,000 feet
b) extension of runway 04/22 from 2,760 feet to 3,800 feet
c) deactivate runway 08/26 for use as a taxiway
d) construction of a control tower
e) erection of a new airport terminal and club house on the north side of the field
f) construction of a new tarmac and installation of aircraft servicing facilities adjacent to the new terminal
g) installation of taxiway lighting at two locations.

Due to the increasing volume of aircraft movement, a control tower has been constructed at the south end of the airport. The proposed extension of runway lengths together with other suggested improvements would permit larger turbo prop cargo and passenger aircraft to utilize the airport. Improved facilities would also serve to make the airport more attractive as a base for pleasure aircraft.

From discussions with City Officials, it is understood that it is necessary for the municipality to acquire ownership of the

airport in order to qualify for Federal financial assistance for its improvement. Negotiations for its acquisition have been undertaken but no final decision has yet been made by the Federal Government.

According to an official of the Department of Transport, a minimal amount of money is presently available for airport improvements and it could take two or more years prior to consideration being given to any proposed improvements.

5. AIRCRAFT NOISE

Public concern regarding aircraft noise has been growing as the size and power of planes has increased. Adverse community reaction to the takeoffs and landings of jet powered aircraft has brought this concern into focus. People will tolerate cars, trucks, buses and other community noises because they form part of the daily routine. They are a recognizable necessity in daily living. The average family however does not accept noisy aircraft presumably because a very small percentage of the population has ever travelled on an airplane and aircraft noise is not accepted as a necessary part of daily life.

Many efforts are being made to provide solutions to aircraft noise problems. They include sound proofing of buildings, location of airports away from built-up areas, provision of buffering of various forms, inclusion of suppression devices and the consideration of sound generation in the design of new engines and aircraft.

The measurement of noise and its effect on humans is not an exact science and at this point in time is at best a subjective analysis of the probable effect on people.

The transmission of aircraft noise is subject to many variables such as air temperature, turbulence and velocity, the presence of such obstacles as trees and walls, topography and perhaps most important, distance from source to receptor. In addition, human reaction to noise varies greatly not only from person to person but from time to time with the same person.

Noise measurement has evolved through three stages or techniques over the past few years. The first of these was the measurement of sound pressure levels calibrated in decibels. This system did not however account for difference in pitch or frequency. For example, the high pitched sound of a jet is more annoying than a low pitched sound of equal pressure. Subsequently, a series of formula were developed which permitted measurement of noise the way they would be heard by the human ear. This system is termed "perceived noise decibels" (PNdb).

The composite noise rating (CNR) is a comparatively recent innovation in rating noise on a subjective basis. This system qualifies the perceived noise rating by the application of correctional factors, taking into account the following data:-

a) the total number of takeoffs or landings per day (7 a.m. to 10 p.m.) and night (10 p.m. to 7 a.m.)
b) the percent of runway utilization
c) the time of day.

Some of the statistical information required to determine the composite noise rating was not available. Therefore, in some instances, the informed opinions of the airport officials were relied upon.

Aircraft landings have not been considered in this analysis at this time. They are not considered significant relative to the subject aircraft within the composite noise rating system. Runway 08/26 oriented in an easterly-westerly direction is not used frequently and therefore has also been excluded from consideration.

The largest and noisiest aircraft to utilize Oshawa Airport are in the 27,000 to 50,000 pound weight group, examples of which are the Douglas DC3, the Martin 202 and 404 and the Grumman Gulfstream.

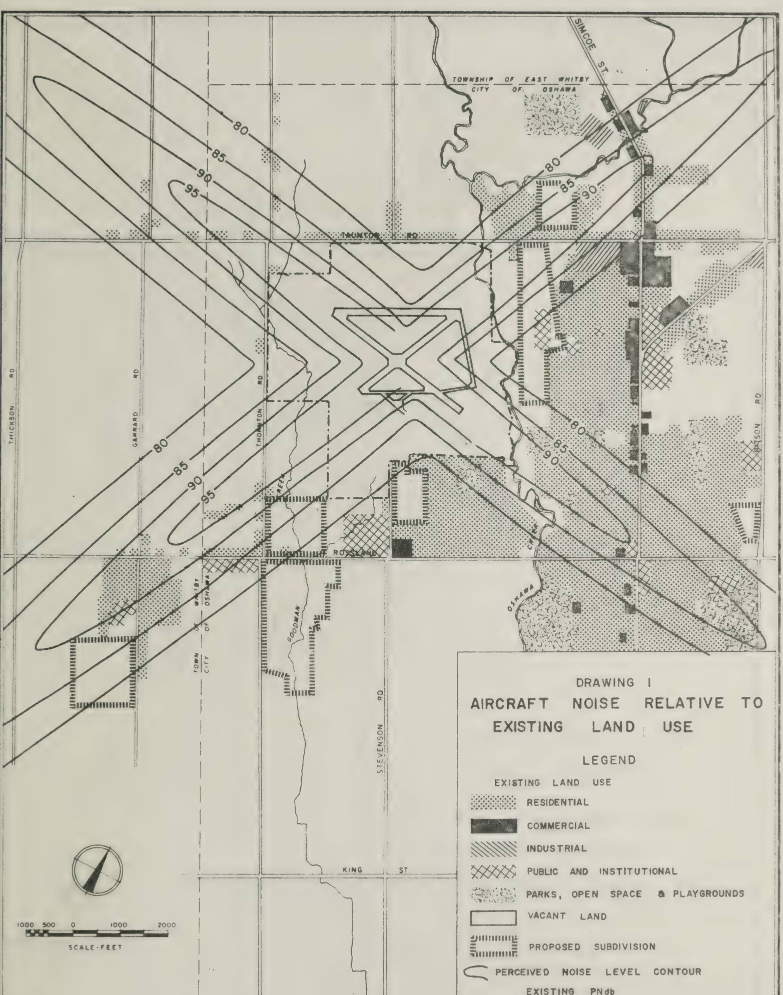
During 1968, these aircraft made a total of 436 takeoffs and landings at the airport. The maximum perceived noise rating of this type of aircraft is 105 PNdb. However, since the frequency

of takeoffs, which emit the loudest noise generation averaged less than one per day, this aircraft type is not considered to represent a noise generation problem at this time.

Aircraft within the 4,000 to 9,000 pound range, such as the Beech 18, Aero Commander, Cessna 310 etc. made a total of 1,931 takeoffs and landings during 1968 as shown on Drawing 1. The composite noise ratings for this aircraft type have been superimposed for comparative purposes over the existing land use around the airport.

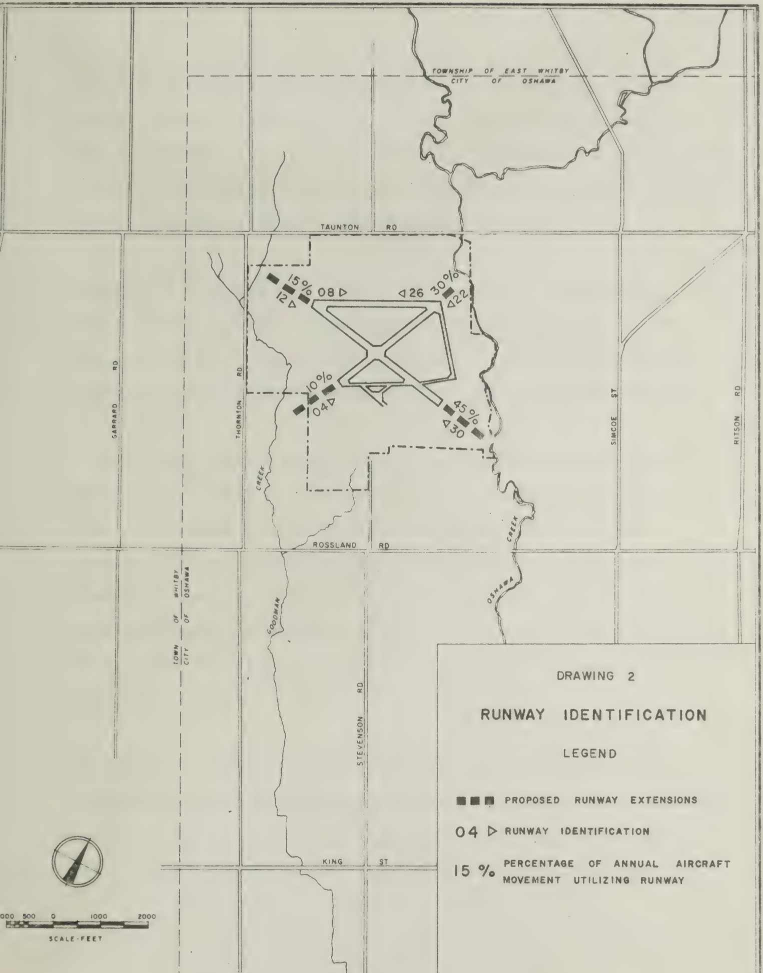
The noise ratings for aircraft taking off from runway 22 (southwesterly direction) and runway 30 (north-westerly direction) are in excess of the ratings of runway 12 (south-easterly) and runway 04 (north-easterly). This is due to the greater frequency of use of the former related to the prevailing wind direction. Drawing 2 indicates runway identification and the percentage distribution of annual traffic movement for each. It is interesting to note that of the approximately 32,700 aircraft takeoffs during 1968, 75% occurred over relatively undeveloped land away from the built-up area of Oshawa.

As may be seen, the maximum perceived noise level reached upon takeoff is rated at 95PNdb for a longitudinal distance of about 4,500 feet from the end of runways 22 and 30. This noise level



DRAWING I

AIRCRAFT NOISE RELATIVE TO EXISTING LAND USE



DRAWING 2

RUNWAY IDENTIFICATION

LEGEND

▬ ▬ ▬ PROPOSED RUNWAY EXTENSIONS

04 ▷ RUNWAY IDENTIFICATION

15 % PERCENTAGE OF ANNUAL AIRCRAFT MOVEMENT UTILIZING RUNWAY

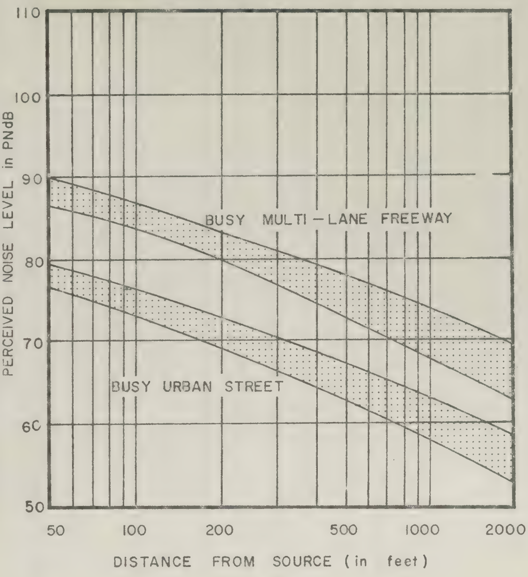
gradually decreases as the plane gains altitude. The furthest lateral distance reached by this noise level is about 400 feet from the runway centre line. Drawing 3 has been included in order that the reader might compare aircraft noise generation with that of more familiar surface transportation vehicles.

The bulk of aircraft movement at the airport is now and will likely continue to be that of light single engined aircraft. Noise rating data was not available for these aircraft, however they are not considered to represent a noise generation problem.

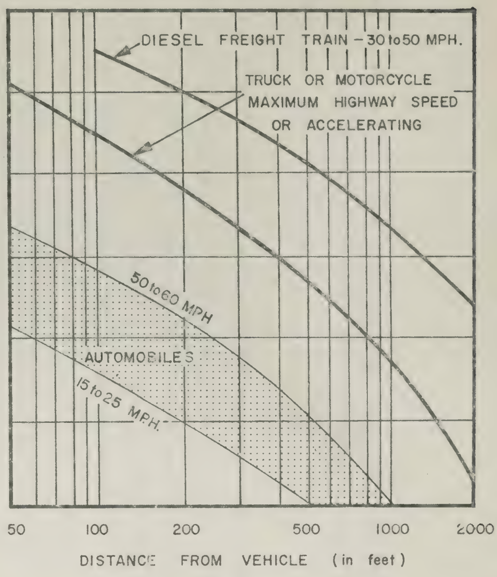
To this point we have been considering the noise generation of the type and number of aircraft which utilized the airport in 1968. In Section 3 of this report, the number of aircraft movements at the airport has been projected into the future. No attempt was made to break this projection into aircraft types, however it may be assumed that this increase will occur within all aircraft classifications which the airport is capable of handling.

The proposed improvements to Oshawa Airport, as contained in the report prepared by Proctor and Redfern Consulting Engineers, were based upon the performance standards of four aircraft which were felt to be representative of the type of aircraft that would use

DRAWING 3



TYPICAL CONTINUOUS NOISE PRODUCED BY HEAVY SURFACE TRAFFIC



TYPICAL INTERMITTENT NOISE PRODUCED BY SURFACE TRANSPORTATION VEHICLES

the airport in the future. They are the Convair 540, Fairchild F27, Grumman G159 and the King Air B90. All these aircraft have turbo-prop (jet) power plants.

Drawing 4 represents a projection of the composite noise ratings for these aircraft and other piston and turbo prop type aircraft in the 27,000 to 50,000 weight group, which presently use the airport. The projection is based upon the following assumptions:-

1. The number of landings for the aforementioned aircraft type will increase to an average of 10 per day.
2. The percent runway utilization will continue at approximately the present distribution.
3. The ratio of daytime flights will continue to be dominant.

As shown, the maximum noise levels will increase to between 105 and 110 PNdb. In interpreting noise levels a change of 10 PNdb corresponds to a subjective judgment of halving or doubling of the noisiness of sound. An increase from the present 95 PNdb to 105-110 PNdb would have a significant impact on those who might live in proximity to the airport runways. It is interesting to note that an increase in the number of takeoffs of aircraft in the 4,000 to 9,000 pound weight group from the present daily average of 3 to 10 would result in an increase from the present 95 PNdb to 100 PNdb.

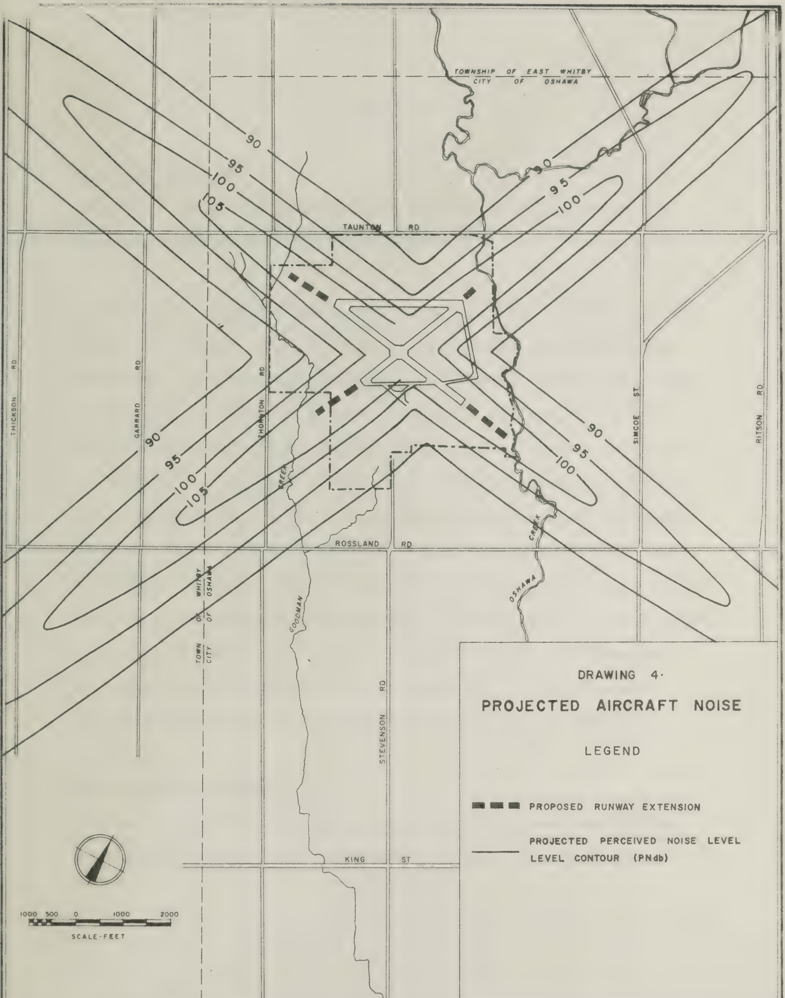
The following table has been used to interpret community reaction to noise:-

TABLE 2

CHART FOR ESTIMATING RESPONSE OF RESIDENTIAL COMMUNITIES FROM COMPOSITE NOISE RATINGS

Composite Noise Rating		
Takeoffs and Landings	Zone	Description of Expected Response
Less than 100	1	Essentially no complaints would be expected. The noise may, however, interfere occasionally with certain activities.
100 to 115	2	Individuals may complain, perhaps vigorously. Concerted group action is possible.
Greater than 115	3	Individual reactions would likely include repeated, vigorous complaints. Concerted group action might be expected.

Source: Bolt Beranek and Newman Inc., Technical Report, "Land Use Planning Relating to Aircraft Noise"



DRAWING 4·

PROJECTED AIRCRAFT NOISE

6. LAND USE

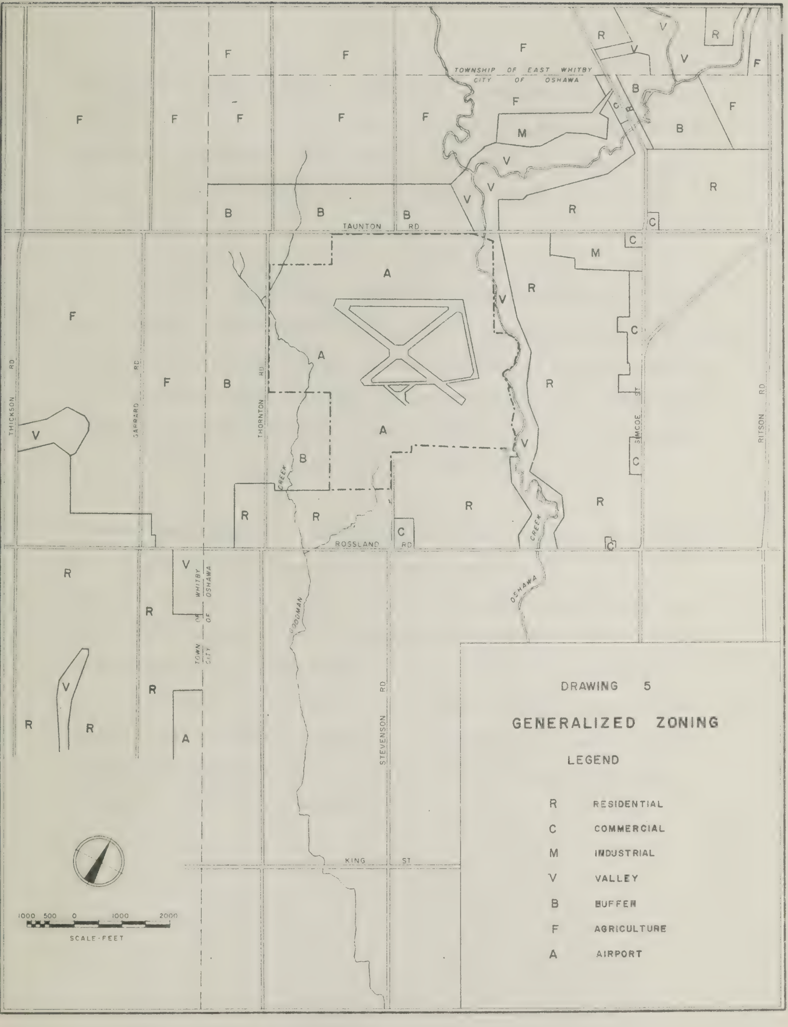
EXISTING LAND USE

Drawing 1 shows Oshawa Municipal Airport in relation to the existing land use of adjacent areas.

To the east, with the exception of Oshawa Creek valley which acts as a buffer, the land is used primarily for residential purposes. Sunset Heights School is situated on the rim of the valley and serves this general area. To the south and east, residential development abutts the southerly airport boundary. St. Joseph's Secondary School is located south of the airport property with an apartment building located east of Stevenson Road and north of Rossland Road. With the exception of some scattered residential development, the lands to the west of the airport are relatively undeveloped. In addition to the existing land use, a number of subdivision applications for residential use have been submitted for lands adjacent to the Airport. The locations of these applications are shown on Drawing 1.

LAND USE REGULATIONS

Drawing 5 indicates the generalized existing land use zoning applicable to the lands surrounding Oshawa Airport. It is



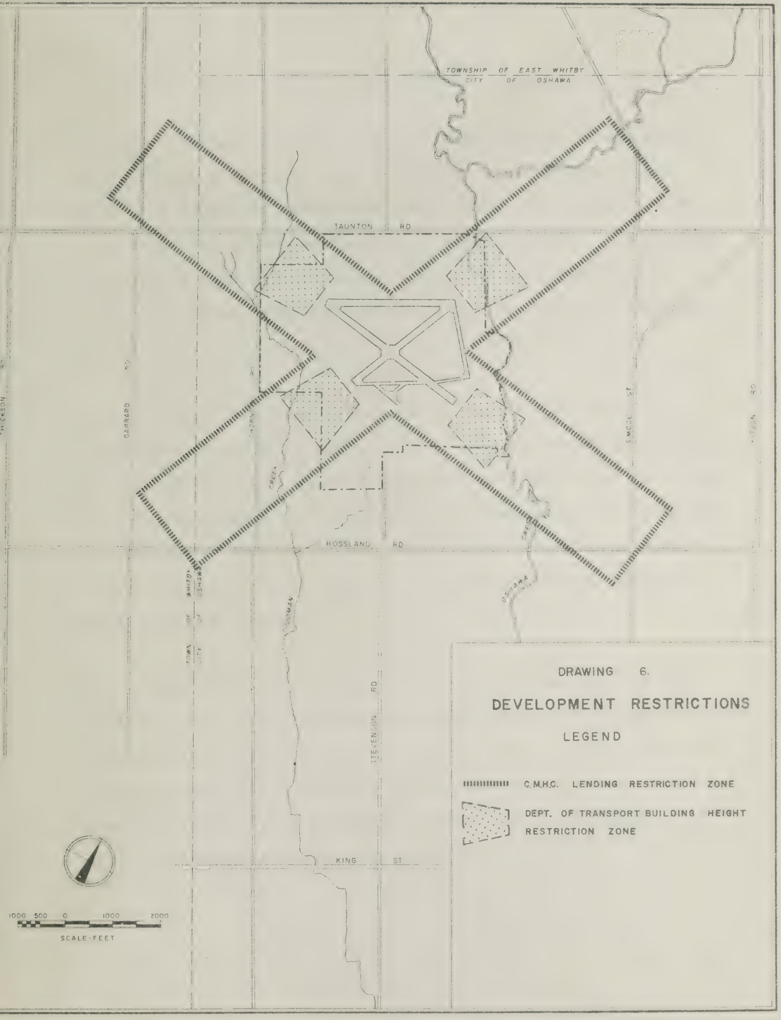
DRAWING 5

GENERALIZED ZONING

anticipated some of these lands will be rezoned in accordance with the revised City Official Plan which is presently in the process of adoption. The lands to the north and west of the airport have been indicated as a special study area in this plan.

In view of the detrimental effect of noise and vibrations in the vicinity of airports, Central Mortgage and Housing Corporation impose lending restrictions on the location of housing adjacent to airport runways. Drawing 6 illustrates the zone affected in relation to Oshawa Airport. It is understood that this policy is presently being reviewed by the Corporation.

Federal Department of Transport regulations require that clearway flight easements be obtained at both ends of all airport runways. Such easements restrict the height of buildings and other fixed objects in the interest of aircraft safety. It is understood from the Department of Transport that easements presently exist at the end of all Oshawa Airport runways. If runways are extended as proposed, these easements will have to be extended accordingly. Drawing 6 also indicates the land affected by existing easements.



DRAWING 6.

DEVELOPMENT RESTRICTIONS

LEGEND

▮▮▮ C.M.H.C. LENDING RESTRICTION ZONE

▨ DEPT. OF TRANSPORT BUILDING HEIGHT RESTRICTION ZONE

7. CONCLUSIONS

In many growing municipalities in Canada and the United States, airports are playing an important role in the expansion and growth of industry. There are indications that there will be increasing use of Oshawa Airport by local industry. It is felt the airport will also serve as an inducement factor in the attraction of new industry to the area. The proposed expansion of airport facilities would facilitate this end.

Oshawa Airport has been chosen for a study by the Federal Government in order to determine the cost and benefits of airports not having scheduled airline service. The results of this study will be fundamental to the future of Oshawa Airport. In essence the study will determine the economic feasibility of a municipality, with the financial assistance of the Federal Government, maintaining an airport.

The volume of aircraft movement has been increasing over the past few years and according to projections is likely to more than double within the next ten years. It is expected that the future primary use of the Oshawa Airport will continue to be for pleasure and training purposes, however, it is anticipated that its use for business purposes will also expand.

Noise generation from aircraft is not considered to be a major problem at this time. This is due in part to the limited use of larger aircraft which produce objectionable noise levels. Comparatively little adverse public reaction to aircraft noise is also due in part to the fact that aircraft utilize the north-westerly (30) and south-westerly (22) runways over relatively undeveloped land.

With the projected expansion of aircraft activity, including the use of large noisy aircraft, noise levels will increase correspondingly. While relatively little is known about the effects of noise on humans empirical evidence indicates that noise levels in excess of 100 PNdb will result in adverse community reaction in the form of complaints and possible group action.

The Central Mortgage and Housing Corporation have recognized this problem and accordingly have placed restrictions on lending money for residential development in proximity to airport runways.

As is the case with many of our land uses, airports have both advantages and disadvantages within the urban environment. Throughout this report we have attempted to examine objectively the present and possible future function of the airport and its relationship to the community.

As planners we are concerned with the distribution of land use, each component in proper relationship to the other. It is quite clear that if the airport is to remain as an integral part of the community, then compatible land use zoning around its periphery must be agreed to. Residential development must be restricted in order to protect future residents and to ensure the safe operation of the airport.

8. RECOMMENDATIONS

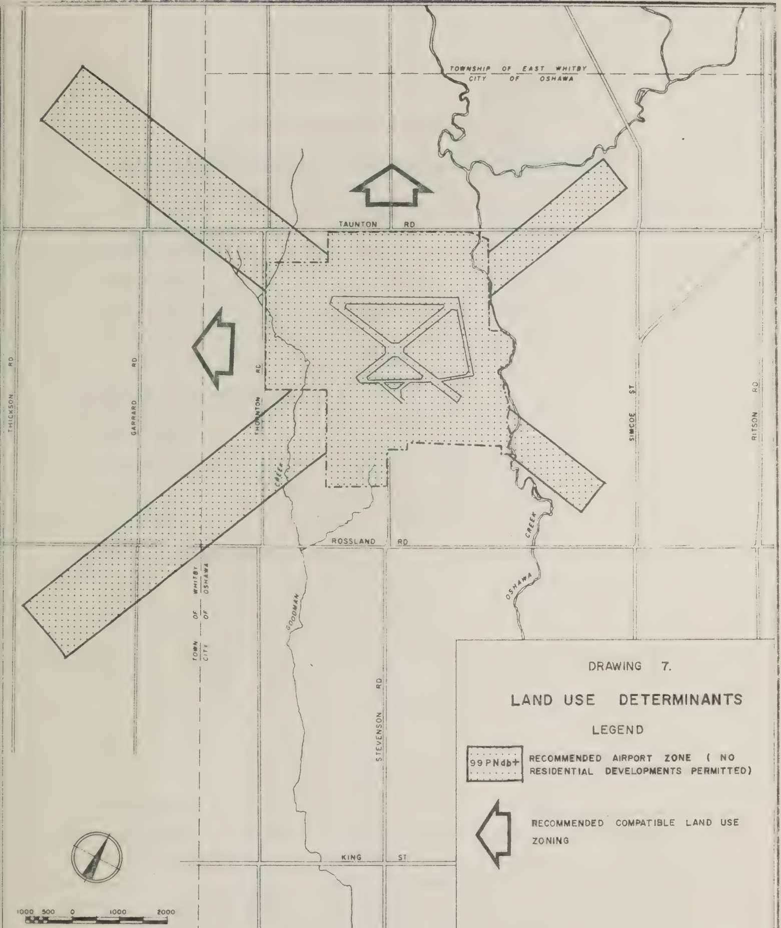
There are two basic considerations which significantly contribute to the determination of the future land uses adjacent to the Oshawa Airport:

1. Residential development is not compatible with airport uses, particularly in alignment with the runways, and
2. The relationship between an active airport and industrial development is becoming more significant.

Therefore, the following recommendations are presented for consideration and endorsement:

1. That an airport zone be established in which no further major residential development would be permitted, with the boundaries of the zone being determined on the basis of projected noise levels, the maximum permissible level being 99 PNdb. (Drawing 7)
2. That in view of the predominant existing residential development east of the airport, infilling of existing residential areas be permitted.
3. That in light of the inherent potential of future industrial development adjacent to the airport, an area for such development be established, preferably west of the airport, providing that the provision of services is economically feasible.

4. That the land north of the airport between the extension of the north-westerly and north-easterly runways be zoned for compatible land uses, including consideration for residential uses provided that there is sufficient area to develop a functional community.
5. That the land indicated on Drawing 7 as being within the zone having an excess of 99 PNdb be considered for uses of the following nature:
    a) open uses involving few people,
    b) inherently noisy activities not sensitive to additional noise,
    c) indoor uses which can be protected from airport noise by soundproofing,
    d) airport allied uses which have an incentive to locate close to the airport.
6. That the recommendations of this study be the basis for the preparation of a detailed land use plan by the City of Oshawa for the area surrounding the Oshawa Airport.



DRAWING 7.

LAND USE DETERMINANTS

APPENDIX 1

OSHAWA MUNICIPAL AIRPORT

AIRCRAFT MOVEMENTS BY CLASS AND TYPE OF OPERATION

	1968	1967	1966
ITINERANT - DOMESTIC			
Scheduled	-	-	-
Other Comm.	3,406	3,016	2,358
Private	1,035	837	695
ITINERANT - TRANSBORDER			
Scheduled	-	-	-
Other Comm.	1,454	741	608
Private	212	225	157
ITINERANT - GOVERNMENT			
Civil	6	2	4
Military	20	55	28
ITINERANT - TOTAL	6,133	4,876	3,850
LOCAL			
Civil	59,205	63,525	57,962
Military	-	-	6
LOCAL - TOTAL	59,205	63,525	57,968
TOTAL - ITINERANT AND LOCAL	65,338	68,401	61,818

APPENDIX 2

AIRCRAFT MOVEMENT STATISTICS

Municipality	Year	Population	Total Aircraft Movement
OSHAWA	1968	83022	65338
	1967	79769	68401
	1966	77126	61818
	1965	73770	* ---
	1964	69822	-----
LONDON	1968	-	100709
	1967	196420	102347
	1966	187624	92425
	1965	181396	66902
	1964	175936	71722
NORTH BAY	1968	-	43157
	1967	41388	41404
	1966	22662	25216
	1965	22633	23936
	1964	23349	39337
LAKEHEAD	1968	-	93628
	1967	94921	89602
	1966	94354	91622
	1965	93443	66229
	1964	92078	53138
HAMILTON	1968	-	141538
	1967	288993	154682
	1966	283345	137402
	1965	280591	91019
	1964	275670	70099
BRANTFORD	1968	-	27020
	1967	59150	25895
	1966	58395	18873
	1965	57338	23921
	1964	56070	31048
SUDBURY	1968	-	18894
	1967	84361	12022
	1966	82339	8074
	1965	80592	7034
	1964	78061	5099

* commenced reporting to D.O.T. in 1966